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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
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09/976,960

10/11/2001

Ronald Miller

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12/14/2004

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EXAMINER

KIK, PHALLAKA


ART UNIT

PAPER NUMBER

2825

DATE MAILED: 12/14/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

|                              |                                      |                                      |   |
|------------------------------|--------------------------------------|--------------------------------------|---|
| <b>Office Action Summary</b> | <b>Application No.</b><br>09/976,960 | <b>Applicant(s)</b><br>MILLER ET AL. |   |
|                              | <b>Examiner</b><br>Phallaka Kik      | <b>Art Unit</b><br>2825              |  |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☒ Responsive to communication(s) filed on 10/1/2001 & 5/1/2003.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 58-120 is/are pending in the application, *wherein claims 1-57 are cancelled and claims 113-121 have been renumbered as claims 112-120.*
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 78-80, 82-87, 90-99, 101-110, 112-117, 119 and 120 is/are allowed.
- 6) ☒ Claim(s) 58-77 is/are rejected.
- 7) ☒ Claim(s) 81, 88, 89, 100, 111 and 118 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 01 October 2001 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

### **DETAILED ACTION**

1. This Office Action responds to the Application filed on 10/1/2001, preliminary amendments filed on 5/1/2003. Claims 58-120 are pending, wherein claims 1-57 have been cancelled and claims 58-120 are newly added, and wherein original claims 113-121 have been renumbered as 112-120 since the original claim 112 does not exist (see claim objections below). [37 CFR 1.126]

### ***Oath/Declaration***

2. It is noted that the oath or declaration contains the claimed domestic priority document which is not properly referenced with the proper application number (not the attorney's docket number). Applicant may file an Application Data Sheet in accordance to 37 CFR. 1.76 to make this proper correction (wherein correction using the Application Data Sheet also constitutes the specific reference required by 35 U.S.C. 119(e) or 120, and § 1.78(a)(2) or § 1.78(a)(4), and need not otherwise be made part of the specification).

### ***Drawings***

3. The drawings are objected to because Figs. 1-28 contain the character of lines, numbers and letters that are not uniformly thick and well defined, clean, durable and black (see 37 CFR 1.84(l) and the shadings of Figs. 7-8,18,20-28 render the Figs. difficult to read and/or indecipherable (see 37 CFR. 1.84(m). Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if

only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

#### ***Claim Objections***

4. The numbering of claims is not in accordance with 37 CFR 1.126 which requires the original numbering of the claims to be preserved throughout the prosecution. When claims are canceled, the remaining claims must not be renumbered. When new claims are presented, they must be numbered consecutively beginning with the number next following the highest numbered claims previously presented (whether entered or not).

**Misnumbered claims 113-121 have been renumbered as 112-120, wherein as per (renumbered) claim 112, the claim has been further amended to depend on claim 111 since the original claim 112 does not exist.**

5. **Claims 66,67,81,88,89,100,111,118** are objected to because of the following informalities:

As per **claim 66**, "sites" (line 2) should be --locations-- for proper antecedent basis.

As per **claim 67**, "legalization" (line 2) should be --legal locations assignment-- for proper antecedent basis.

As per **claim 81**, "cell" (line 2) should be --cells-- for proper antecedent basis.

As per **claim 88**, "step" (line 2) should be replaced with --a y-location of the cells-- to clearly identify the step being referred to since the independent claim 78, which the claims depend, recites an optimizing the cost function.

As per **claim 89**, the claim is objected to for incorporating the above error into the claim by claim dependency.

As per **claim 100**, "step" (line 2) should be replaced with --a y-location of the cells-- to clearly identify the step being referred to since the independent claim 90, which the claims depend, recites an optimizing the cost function.

As per **claim 111**, "step" (line 2) should be replaced with --a y-location of the cells-- to clearly identify the step being referred to since the independent claim 102, which the claims depend, recites an optimizing the cost function.

As per **claim 118**, "row" (line 21) should be --rows-- since there are two of them.

Appropriate correction is required.

#### ***Claim Rejections - 35 USC § 102***

6. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

7. **Claims 58-77** are rejected under 35 U.S.C. 102(e) as being anticipated by **Eng** (US Patent Application Publication No. 2002/0059553).

As per **claim 58**, all of the elements of the claims are illustrated in Fig. 2, wherein the netlist is received at least from blocks 202 and 228 as the results of the logic or LBB synthesis (202, 228), the specification for placement is received at least from blocks 223-226, 222, 216, 214, 205, wherein the initial placement is performed in at least blocks 215, 213 (see also paragraphs [0187]), the detailed placement is performed in blocks 227,229,231 (see also paragraphs [0188]-[0189]), and the synthesis process is performed in blocks 202,228.

As per **claim 65,66**, the detailed placement process performing only legalization (i.e., snapping or moving cells to legal or non-overlapping sites) is part of the compaction step 1303 described in paragraph [0188], wherein the synthesis (block 228) and detailed placement (blocks 227,229,231) being performed several times is illustrated in Fig. 2.

As per **claim 71-73,75**, the detailed placement including only performing legalization and snapping of cells, and synthesis, the iteration thereof, are discussed in the rejection of claim 65 above, wherein the synthesis being timing driven is described

in paragraph [0038], and wherein the integration of the detailed placement and synthesis is illustrated in Fig. 2, being integrated as part of the chip optimizer 213.

As per **claim 59-60**, all of the elements of claim 58, which the claims depend, are discussed previously, wherein the detailed placement process performing only legalization (i.e., snapping or moving cells to legal or non-overlapping sites) is part of the compaction step 1303 described in paragraph [0188].

As per **claims 61,67,74**, all of the elements of claims 58,65,71, which the claims respectively depend, are discussed previously, wherein the movement of a minimum distance (i.e., minimum perturbation) to achieve legalization (i.e., non-overlapping) is further described in paragraph [0265].

As per **claim 62**, all of the elements of claim 58, which the claim depends, are discussed previously, wherein the iteration of the detailed placement process and synthesis process is illustrated in the design flow shown in Fig. 2, wherein the synthesis (228) is iterated via the chip optimizer 213 through the paths of blocks 229, 231, 232, 218, 213 (see also paragraph [0008]).

As per **claims 63,68**, all of the elements of claims 58 and 65, which the claims respectively depend, are discussed previously, wherein the synthesis being timing driven is described in paragraph [0038].

As per **claims 64,76**, all of the elements of claims 58 and 71 above, which the claims depend respectively, are discussed previously, wherein the coarse placement being congestion driven is described in [0187] as part of the force-directed method and

iteratively improved by packing the clusters, which inherently eliminates or reduce congestion, as is well known in the art, allowing the feasible implementations.

As per **claim 69**, the coarse placement being performed before the detailed placement and synthesis process is also illustrated in Fig. 2, wherein at least initial placements blocks 210 and 212 are performed prior to the synthesis 228 and detailed placement blocks 227,229,231.

As per **claims 70,77**, all of the elements of claims 69 and 71 above, which the claims depend respectively, are discussed previously, wherein the coarse (initial) placement with minimized wire length is described in paragraph [0187].

***Allowable Subject Matter***

8. **Claims 78-80,82-87,90-99,101-110,112-117,119-120** are allowed.
9. **Claims 81,88,89,100,111,118** would be allowable if rewritten to overcome the objection due to minor informalities set forth in this Office action.
10. The following is a statement of reasons for the indication of allowable subject matter:

As per **claims 78-120**, Applicant's preliminary amendment and arguments filed on 5/1/2003 set forth the patentability of Applicant's claimed invention, wherein as pointed out by Applicant, the independent claims 78,90,102,114-121, which the optimized cost function dependent on the sites in pairs of rows, are used as part of the detailed placement process and the swapping of cells between pairs of rows, as part of the method for placing cells of a netlist, as claimed, which the prior arts made of record failed to teach or suggest (see preliminary amendment filed on 5/1/2003, pages 16-18).



Accordingly, the claimed invention is novel and un-obvious over the prior arts made of record.

***Conclusion***

11. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Therefore, Applicant is requested herein to consider them carefully in response to this Office Action.

12. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Phallaka Kik whose telephone number is 571-272-1895. The examiner can normally be reached on Flexitime.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Matthew S. Smith can be reached on 571-272-1907. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

**Any response to this action should be mailed to:**

Commissioner for Patents

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Alexandria, VA 22313-1450


**or faxed to:**

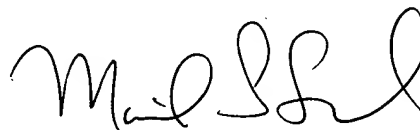
703-872-9318 (for Before-Final) and 703-872-9319 (for After-Final) for  
formal communications intended for entry,

**Or:**

(571) 273-1895 (for informal or draft communications, please label  
"PROPOSED" or "DRAFT" and let the examiner know prior to  
faxing).

PK

  
December 11, 2004



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